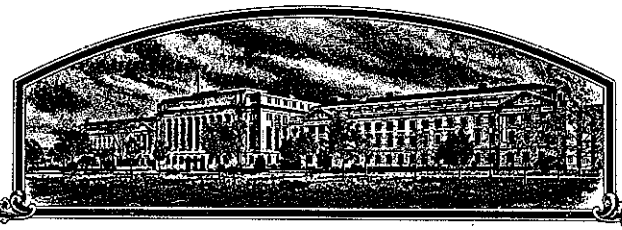

No. 8200154

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Pure-Seed Testing, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.).

PERENNIAL RYEGRASS

'Manhattan II'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington this 31st day of May in the year of our Lord one thousand nine hundred and eighty-four.

Attest:

Kenneth A. Evans
Commissioner
Plant Variety Protection Office
Livestock, Meat, Grain & Seed Division
Agricultural Marketing Service

John R. Block
Secretary of Agriculture

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

INSTRUCTIONS: *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

1a. TEMPORARY DESIGNATION OF VARIETY	1b. VARIETY NAME	FOR OFFICIAL USE ONLY
MMG-80	Manhattan II	PV NUMBER 8200154
2. KIND NAME: perennial ryegrass	3. GENUS AND SPECIES NAME: Lolium perenne	FILING DATE 8/20/82 — TIME 2:30 A.M. P.M.
4. FAMILY NAME (BOTANICAL): Gramineae	5. DATE OF DETERMINATION: September, 1981	FEE RECEIVED $ 500.00 $ 250.00 — DATE 8/20/82 4/24/84
6. NAME OF APPLICANT(S): Pure-Seed Testing, Inc.	7. ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*): P. O. Box 449, 73 West G Street, Hubbard, OR 97032	8. TELEPHONE AREA CODE AND NUMBER: 503-981-7333

9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: (*Corporation, partnership, association, etc.*)	10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION	11. DATE OF INCORPORATION
Corporation	Oregon	June 3, 1974

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:

Dr. William A. Meyer, Pure-Seed Testing, Inc.
P. O. Box 449, Hubbard, OR 97032

13. **CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:**

- [XX] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [XX] 13B. Exhibit B, Novelty Statement.
- [XX] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [XX] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [XX] NO

14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?	14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED?
[X] YES [ ] NO	[X] FOUNDATION [ ] REGISTERED [X] CERTIFIED

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [X] YES [ ] NO *(If "Yes," give name of countries and dates.)*

The Netherlands, November 1981.

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

August 13, 1982
(DATE)

William A Meyer
(SIGNATURE OF APPLICANT)

1

(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

EXHIBIT A.

ORIGIN AND BREEDING HISTORY OF
MANHATTAN II PERENNIAL RYEGRASS

1. Manhattan II is an advanced generation synthetic cultivar selected from the progenies of 22 clones. Crown rust resistant clones were selected from PI 197, 270 (Finland), Sprinter and from germplasm collections from old turfs in New Jersey and Maryland. These diverse sources of crown rust resistance were used in a modified backcrossing program using plants selected from Manhattan as recurrent parents. In addition, phenotypic recurrent selection for stress tolerance, disease resistance, attractive appearance and improved mowing qualities were followed by progeny testing in seeded turf trials to produce nine separate breeding populations. Selections from these nine breeding populations were subsequently used as recurrent parents in a program to improve resistance to stem rust. Stem rust resistant plants selected from old turfs in Missouri and Washington D.C. and Oregon were used as donor parents in a modified backcross program. Again, phenotypic recurrent selection for attractive appearance, stress tolerance, disease resistance, and mowing quality, and progeny testing in closely mowed turf plots in Oregon and New Jersey were used to enhance the effectiveness of the backcrossing program. Twenty-two highly stem and crown rust resistant plants were selected as the parents of Manhattan II. MMG-80 was the experimental designation of Manhattan II.

2. Breeder seed of Manhattan II was produced from an isolated space plant nursery of the 22 rust resistant clones. Seed propagation is limited to two generations of increase from breeder seed--one each of foundation and certified.

3. Manhattan II is a stable and uniform variety. No off-type plants or variants have been observed in the reproduction or multiplication of Manhattan II perennial ryegrass. Manhattan II perennial ryegrass and the progenies of the 22 parental clones have produced turf of good quality and uniformity.

EXHIBIT B.

NOVELTY STATEMENT ON
MANHATTAN II PERENNIAL RYEGRASS

Manhattan II perennial ryegrass is most similar to Manhattan perennial ryegrass. However, close comparisions show the two varieties differ in the following characteristics:

1. Manhattan II is resistant to stem rust while Manhattan is susceptible (Table 5).
2. Manhattan II is 13 days earlier than Manhattan (Table 6).
3. Manhattan II has 100 or more tillers per 100 sq. cm. than Manhattan (Table 1,7).

FORM APPROVED: OMB NO. 40-R3712

FORM GR-470-36 (9-76)

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

OBJECTIVE DESCRIPTION OF CULTIVARS
RYEGRASS
(Lolium spp.)

NAME OF APPLICANT(S)	VARIETY NAME OR TEMPORARY DESIGNATION
Pure-Seed Testing, Inc.	Manhattan II
ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code)	FOR OFFICIAL USE ONLY
P. O. Box 449 Hubbard, OR 97032	PVPO NUMBER 8200154

Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in first box (e.g. 0 8 9 or 0 9)when number if either 99 or less or 9 or less. Descriptions of characters should represent those that are typical for the variety. Ranges may be given also. Measured data should be for SPACED PLANTS. Give additional description for all characteristics that cannot be adequately described in the form below. Append all pertinent comparative trial and evaluation data.

1. SPECIES:

[2] 1 = L. MULTIFLORUM (annual or Italian; includes Westerwoldicum) 2 = L. PERENNE (perennial) 3 = L. RIGIDUM (includes Wimmera)
4 = HYBRID (of species) _____ 5 = OTHER (Specify) _____

2. PLOIDY:

[1] 1 = DIPLOID 2 = TETRAPLOID 3 = OTHER (Specify) _____

3. DURATION:

[3] 1 = ANNUAL OR BIENNIAL 2 = SHORT LIVED PERENNIAL (3-4 years) 3 = PERENNIAL (more than 4 years)

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

4. MATURITY (50% HEADED) Use standards from above for comparison:

[5] 1 = VERY EARLY 3 = EARLY 5 = MEDIUM 7 = LATE 9 = VERY LATE

[1 3] DAYS EARLIER THAN [7] STANDARD CULTIVAR
[ ] DAYS LATER THAN [ ] STANDARD CULTIVAR

Table 6.

5. MATURE PLANT HEIGHT (Use standard cultivars from above) :

[7 0] CM. HIGH [ ] CM. SHORTER THAN [ ] STANDARD CULTIVAR
[0] CM. TALLER THAN [7] STANDARD CULTIVAR

Table 2.

6. PERCENT WINTER DAMAGE (estimated as percent of the area appearing dead). Use standard cultivars from above for comparison:

[0] PERCENT DAMAGE OF APPLICATION CULTIVAR
[ ] PERCENT DAMAGE OF [ ] STANDARD CULTIVAR

7. TURF DENSITY Use standard cultivars from above:

[5 1 3] TILLERS PER 100 SQ. CM.
[ ] LESS TILLERS PER 100 SQ. CM. THAN [ ] STANDARD CULTIVAR
[2 1 1] MORE TILLERS PER 100 SQ. CM. THAN [7] STANDARD CULTIVAR

Table 1.

8. FLAG LEAF (at full growth) Use standard cultivars from above: Table 2.

[1 3.3] CM. LENGTH (from ligule to tip) [4] MM. WIDTH (at widest point)
[ ] CM. SHORTER THAN [ ] STANDARD CULTIVAR
[.9] CM. LONGER THAN [7] STANDARD CULTIVAR
[.4] MM. NARROWER THAN [7] STANDARD CULTIVAR
[ ] MM. WIDER THAN [ ] STANDARD CULTIVAR

[3] FLAG LEAF AT BOOT STAGE: 1 = DEFLEXED 3 = RECURVED 5 = HORIZONTAL 7 = SEMI-ERECT 9 = ERECT

STANDARD CULTIVARS

1 = GULF 2 = WIMMERA 62 3 = LINN 4 = PELO
5 = NORLEA 6 = ABERYSTWYTH S-23 7 = MANHATTAN 8 = PENNFINE

9. LEAVES:

[3] VERNATION: 1 = LEAVES ROLLED IN YOUNG SHOOTS
2 = LEAVES SEMI-ROLLED (folded with rolled edges)
3 = LEAVES FOLDED IN YOUNG SHOOTS

[7 0] % PLANTS WITH ANTHOCYANIN IN LOWER LEAF SHEATH

[3] FOLIAGE COLOR: 1 = YELLOW GREEN 2 = MEDIUM GREEN 3 = BLUE GREEN

10. SPIKE:

[2 0 6] MM. SPIKE LENGTH (tip to internode below lowest floret)

[3 9] MM. SHORTER THAN ..... [7] } USE STANDARD CULTIVARS FROM ABOVE

[ ] MM. LONGER THAN ..... [ ] }

[ ] MG. PER TEN SPIKES (trimmed to internode below lowest floret)

[ ] MG. LIGHTER PER TEN SPIKES THAN ..... [ ] } USE STANDARD CULTIVARS FROM ABOVE

[ ] MG. HEAVIER PER TEN SPIKES THAN ..... [ ] }

[ ] FLORETS PER SPIKELET

PERCENTAGE OF PLANTS WITH:

RACHIS: [ ] % SMOOTH [ ] % ROUGH

SPIKE COLOR: [ ] % GREEN [ ] % PURPLE

LEMMA: [0] % AWNED [ ] MM. AWN LENGTH

[6 7] MM. GLUME LENGTH Table 3.

[ ] 1 = SPIKELET LENGTH NEARLY EQUAL TO OUTER GLUMES
2 = SPIKELET LENGTH MUCH LONGER THAN OUTER GLUMES

11. COLEOPTILE:

[ ] % PLANTS WITH ANTHOCYANIN IN COLEOPTILE

12. ANTHER COLOR:

[3 5] % PLANTS WITH WHITE ANTHERS [6 0] % PLANTS WITH YELLOW ANTHERS

[5] % PLANTS WITH PURPLE ANTHERS

13. ROOT AND PLANT CHARACTERS:

[1 0 0] % PLANTS WITH PROSTRATE GROWTH HABIT [0] % PLANTS WITH FLUROESCENT ROOTS

[ ] % PLANTS WITH UPRIGHT GROWTH HABIT

14. SEED:

[8 2 4] MG. PER 1,000 SEED [5 3. 3] MM. TOTAL LENGTH OF 10 SEEDS [1 2. 8] MM. TOTAL WIDTH OF TEN SEEDS

15. DISEASE (0 = NOT TESTED, 2 = HIGHLY SUSCEPTIBLE, 4 = MODERATELY SUSCEPTIBLE, 6 = MODERATELY RESISTANT, 8 = HIGHLY RESISTANT):

6	CROWN RUST (Puccinia coronata)	7	DOLLAR SPOT (Sclerotinia)	7	BROWN PATCH (Rhizoctonia)
7	LEAF SPOT (Helminthosporium)		MILDEW	8	OTHER *(Specify)* Stem rust (Tables 4,5 & 8)
	SNOW MOLD (Typhula)	6	RED THREAD (Corticium)		

16. INSECT (0 = NOT TESTED, 2 = HIGHLY SUSCEPTIBLE, 4 = MODERATELY SUSCEPTIBLE, 6 = MODERATELY RESISTANT, 8 = HIGHLY RESISTANT):

[ ] *(Specify)* _____

17. GIVE RESEMBLANCE VALUE IN LEFT COLUMN AND VARIETY CODE NUMBER IN RIGHT COLUMN FOR VARIETY WITH WHICH COMPARISON IS MADE (1 = LESS THAN, 2 = SAME AS, 3 = MORE ERECT, MORE RESISTANT, DENSER, MORE PERSISTENT, DARKER OR GREATER HEIGHT.):

RESEMBLANCE	CHARACTER	SIMILAR VARIETY	
1	PLANT HABIT (erectness)	7	1 = GULF
3	TILLERING	7	2 = WIMMERA 62
2	WINTER HARDINESS	7	3 = LINN
3	HIGH TEMP. STRESS RESISTANCE	7	4 = PELO
3	TURF PERSISTENCE	7	5 = NORLEA
3	PLANT COLOR	7	6 = ABERYSTWYTH S-23
1	VERTICAL SEEDLING GROWTH RATE	7	7 = MANHATTAN
3	CROWN DENSITY	7	8 = PENNFINE
3	MOWER SHREDDING RESISTANCE	7	

18. GIVE AREA OF ADAPTATION AND INTENDED USE: Cool Season area of U.S. and Overseeding

19. GIVE AREA TEST RESULTS PRESENTED FROM: New Jersey and Oregon.

COMMENTS:

EXHIBIT D.

ADDITIONAL DESCRIPTION OF
MANHATTAN II PERENNIAL RYEGRASS

Manhattan II is a leafy, attractive, persistent, turf-type variety of medium maturity. It is capable of producing a dense, fine textured, medium low growing turf with a bright dark green color (Table 1,4). Manhattan II has excellent seedling vigor, winter brown blight resistance (incited by Drechslera spp.), and the wide range of soil and climatic adaption of Manhattan perennial ryegrass. It is resistant to stem rust incited by Puccinia graminis Pers., many races of crown rust caused by P. coronata Corda, brown patch (Rhizoctonia solani) and red thread (Laetisaria fuciformis) (Table 4,5). Manhattan II also shows improved heat tolerance, summer performance and mowing qualities, and is much more dense than Manhattan (Table 1,4,7,8).

Table 1. Tiller densities and leaf width measurements of perennial ryegrass varieties grown at Adelphia, New Jersey.

Variety	Tillers per 100 sq. cm.	Leaf width mm.	Variety	Tillers per 100 sq. cm.	Leaf width mm.
1. Manhattan II	513	1.7	31. Manhattan	302	2.0
2. R-39A	460	1.8	32. Rex	296	2.1
3. Prelude	457	1.9	33. Barcelona	288	2.0
4. Palmer	457	1.7	34. Caravelle	269	2.1
5. BT-1	446	1.9	35. Bar LpCS	233	2.2
6. Citadel	436	1.8	36. Cropper	196	2.4
7. Premier	436	1.8	37. NV1-Code	170	2.3
8. Yorktown II	434	1.7			
9. Barry	427	1.6	Merion K.B.	275	1.9
10. Blazer	426	1.7			
			$LSD_{.05}$ =	53	0.2
11. Elka	424	1.6			
12. Goalie	420	1.9			
13. Syn 2ED	415	1.9			
14. Jackpot	407	1.8			
15. Barclay	406	1.9			
16. Belle	404	1.9			
17. Delray	403	1.9			
18. Loretta	402	1.6			
19. Regal	398	1.9			
20. Fiesta	394	1.8			
21. Ranger	379	1.9			
22. Rye 141	377	1.9			
23. Trimmer	374	1.8			
24. Dasher	371	1.9			
25. Diplomat	362	1.9			
26. HE-142	359	1.9			
27. Derby	357	1.9			
28. Acclaim	355	1.9			
29. Pennfine	355	1.9			
30. Pennant	353	1.9			

TABLE 4.

TURF PERFORMANCE OF PERENNIAL RYEGRASSES
SEEDED NEAR HUBBARD, OR FALL, 1980
AND MAINTAINED AT MODERATE FERTILITY.

CULTIVAR	AVE. TURF QUALITY, 1981 12 OBSERVATIONS 9-1 (9=best)	LEAF SPOT 2/19/81 9-1 (9=best)	CROWN RUST 8/25/81 9-1 (9=best)	RED THREAD 3/12/82 9-1 (9=best)
Manhattan	5.7	5.0	5.7	4.0
Manhattan II	6.7	7.0	8.4	6.4

TABLE 5.

PERFORMANCE OF PERENNIAL RYEGRASSES
IN SEED YIELD TRIALS NEAR HUBBARD, OR IN 1981 & 1982

	STEM RUST 9-1 (9=best)	
	FALL, 1980 SEEDING	FALL, 1981 SEEDING
CULTIVAR	7/14/81	7/23/82
Manhattan II	9.0	9.0
Manhattan	5.0	3.5
LSD (0.05)	0.66	1.12

TABLE 6.

HEADING DATES OF PERENNIAL RYEGRASSES
IN SEED YIELD TRIALS NEAR HUBBARD, OR IN 1981 & 1982

	50% HEADING DATES			
	FALL, 1980 SEEDING		FALL, 1981 SEEDING	
CULTIVAR	1981	1982		1982
Manhattan II	5/28	5/26		5/27
Manhattan	6/11	6/8		6/9

TABLE 7.

TILLER DENSITIES OF PERENNIAL RYEGRASSES
IN TURF TRIALS NEAR HUBBARD, OR SEEDED THE FALL OF 1981.

CULTIVAR	DENSITY 8/12/82 TILLERS PER 100 SQ. CM.
Manhattan II	417
Manhattan	317
LSD (0.05)	23

TABLE 8.

PERFORMANCES OF PERENNIAL RYEGRASSES
IN ADELPHIA, NJ AND BELTSVILLE, MD.
TRIALS SEEDED FALL, 1980
AND MAINTAINED AT MODERATE FERTILITY.

CULTIVAR	TURF QUALITY 9-1 (9=best) ADELPHIA, NJ AVE. 1981	9-1 (9=best) BELTSVILLE, MD AVE. 1981	9-1 (9=best) CROWN RUST BELTSVILLE, MD
Manhattan	5.5	6.1	4.7
Manhattan II	7.6	7.3	7.7
LSD (0.05)	0.6